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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,710	11/12/2002	Aditya Kumar	122238-1	4261

23413 7590 03/25/2004

CANTOR COLBURN, LLP  
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BLOOMFIELD, CT 06002

EXAMINER
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TRAN, DALENA

ART UNIT	PAPER NUMBER
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3661

DATE MAILED: 03/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.



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4

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Commissioner for Patents

**Office Action Summary**

Application No.

10/065,710

Applicant(s)

KUMAR ET AL.

Examiner

Dalena Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,6-10,13-17 and 20 is/are rejected.
- 7) ☒ Claim(s) 4,5,11,12,18 and 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### Notice to Applicant(s)

1. This application has been examined. Claims 1-20 are pending.
2. Claim 13 is a system claim. Claims 14-19 are depend on claims 13-14, and 17-18.

Therefore, claims 14-19 should be systems claims too. Correction is required.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, are rejected under 35 U.S.C.103(a) as being unpatentable over B.N. Torell (2,731,794) in view of Wang et al. (6,619,261).

As per claim 1, B.N. Torell discloses a method for estimating a temperature profile for individual combustion cans at an inlet of a gas turbine, method comprising: determining an exhaust temperature profile of exhaust gas of the gas turbine (see column 1, lines 15-27). B.N. Torell does not disclose a model-based estimator of turbine components. However, Wang et al. disclose inputting exhaust temperature profile into a model-based estimator of turbine components through which turbine gas flows (see column 3, line 38 to column 4, line 19; column 9, lines 5-55; and column 10, lines 44-67), and wherein model-based estimator calculates an estimated inlet temperature profile at the gas turbine inlet, based upon exhaust temperature profile and design parameters of the gas turbine, estimated inlet temperature profile being indicative of the actual firing temperature of each of the individual combustion cans (see column

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4, lines 19-67; and column 8, lines 5-43). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teach of B.N. Torell by combining inputting exhaust temperature profile into a model-based estimator of turbine components through which turbine gas flows, and calculates an estimated inlet temperature profile at the gas turbine inlet for controlling engine fueling in a manner that limits engine exhaust temperature to an establish engine exhaust temperature limit.

As per claim 2, B.N. Torell discloses determining an exhaust temperature profile comprises obtaining exhaust temperature data from a plurality of temperature thermocouples circumferentially disposed about a longitudinal axis of the turbine (see column 1, lines 15-27).

As per claim 3, Wang et al. disclose model-based estimator applies a set of equations for each stage of the turbine, set of equations relating input temperature, pressure, longitudinal velocity, and tangential velocity of the turbine gas to output temperature, pressure, longitudinal velocity, and tangential velocity of the turbine gas (see column 6, line 20 to column 7, line 36; column 7, line 50 to column 8, line 4; and column 9, lines 5-55).

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5. Claims 6-10,13-17, and 20, are rejected under 35 U.S.C.103(a) as being unpatentable over B.N. Torell (2,731,794) in view of Ohyama et al. (5,533,329), and Mirsky et al. (5,622,042).

As per claims 6, and 20, B.N. Torell discloses a method for estimating a temperature profile for individual combustion cans at an inlet of a gas turbine, method comprising: obtaining exhaust temperature data from exhaust of the gas turbine (see column 1, lines 15-27). B.N. Torell does not disclose normalizing exhaust temperature data. However, Ohyama et al. disclose normalizing exhaust temperature data to a reference load condition to obtain a normalized

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exhaust temperature profile (see column 4, line 45 to column 5, line 15). B.N. Torell also does not disclose model-based estimator. However, Mirsky et al. disclose inputting normalized exhaust temperature profile into a model-based estimator of turbine components through which turbine gas flows (see column 2, line 26 to column 3, line 10), wherein model-based estimator calculates an estimated inlet temperature profile at the gas turbine inlet, based upon normalized exhaust temperature profile and design parameters of the gas turbine, estimated inlet temperature profile being indicative of the actual firing temperature of each of the individual combustion cans (see column 3, lines 11-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teach of B.N. Torell by combining normalizing exhaust temperature data, and inputting normalized exhaust temperature profile into a model-based estimator for accurately measure the condition of the combustion cans to protect damage or destruction of high temperature.

As per claim 7, B.N. Torell also does not disclose obtaining exhaust temperature data under varying load conditions. However, Ohyama et al. disclose obtaining exhaust temperature data under varying load conditions (see column 8, lines 3-47). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teach of B.N. Torell by combining obtaining exhaust temperature data under varying load conditions for controlling the flow rate of combustion air from a compressor to the gas turbine.

Also, as per claim 8, Ohyama et al. disclose obtaining exhaust temperature snapshots from a base load and further obtaining exhaust temperature snapshots from progressively smaller loads down to a part load, wherein data from exhaust temperature snapshots are corrected for

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mean temperature shift and swirl variation (see column 7, lines 53-67; column 8, lines 50-67; and column 10, line 56 to column 11, line 27).

As per claim 9, B.N. Torell discloses determining an exhaust temperature profile comprises obtaining exhaust temperature data from a plurality of temperature thermocouples circumferentially disposed about a longitudinal axis of the turbine (see column 1, lines 15-27).

As per claim 10, Mirsky et al. disclose model-based estimator applies a set of equations for each stage of the turbine, set of equations relating input temperature, pressure, longitudinal velocity, and tangential velocity of the turbine gas to output temperature, pressure, longitudinal velocity, and tangential velocity of the turbine gas (see column 2, line 27 to column 3, line 10).

Claims 13-17, are system claims corresponding to method claims 6-10 above. Therefore, they are rejected for the same rationales set forth as above.

6. Claims 4-5, 11-12, and 18-19, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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### **Conclusion**

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

. I.E. Marvin (3,377,848)

. Kniat (4,055,997)

. Hays (6,668,537)

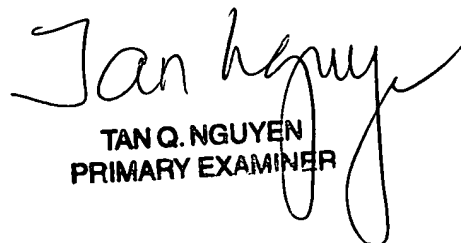
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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalena Tran whose telephone number is 703-308-8223. The examiner can normally be reached on M-F (7:30 AM-5:30 PM), off every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Cuchlinski can be reached on 703-308-3873. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

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TAN Q. NGUYEN  
PRIMARY EXAMINER

/dt  
March 17, 2004